ABSTRACT OF THE DISCLOSURE

[0032]   A method and apparatus for detecting obstacles in off-road applications. A stereo camera and specific image-processing techniques enable a vehicle's vision system to identify drivable terrain in front of the vehicle. The method uses non-drivable residuals (NDR), where the NDR is zero for all terrain that can be easily traversed by the vehicle and greater than zero for terrain that may not be traversable by the vehicle. The method utilizes a depth map having a point cloud that represents the depth to objects within the field of view of the stereo cameras. The depth map is tiled such that the point cloud data is represented by an average (smoothed) value. The method scans pixels in the smoothed depth map to find sequences of "good" points that are connected by line segments having an acceptable slope. Points that lie outside of the acceptable slope range will have an NDR that is greater than zero. The vehicle control system can use the NDRs to accurately make decisions as to the trajectory of the vehicle.